PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in Parallel Rules

I, WILLIAM BLAINE LUARD, Lieut. R.N. retired, a Subject of the King of Great Britain, of 14, Woodlane, Falmouth, in the County of Cornwall, do hereby declare the nature of this invention to be as follows:—

With the well known construction of parallel rule in which the two straight edges or component rulers are connected together by a pair of parallel links pivoted at their ends on the upper faces of the rulers, the latter can only be moved about in a limited manner, owing to the fact that the pivots of the links must always move in circular arcs, so that it is only possible to vary the distance between the straight edges or rulers by moving one or both of them in the direction of their lengths at the same time, and, similarly, the rulers can only be moved relative to one another longitudinally by varying at the same time the transverse distance between them.

The object of the present invention is to extend the range of movement of the two component rulers relatively to one another and provide a construction in which, for example, one ruler can be moved relatively to another longitudinally without alteration of the distance between the two rulers or, conversely, the transverse distance between the rulers may be varied without necessarily involving longitudinal movement.

According to the present invention therefore, the two rulers or straight edges forming the parallel rule are connected together by means of a linkage arrangement connected to slides capable of movement longitudinally of the rulers so that variation of the distance between the rulers and longitudinal movement thereof are independent, which enables the two rules to be separated by a movement at right angles to their length, and also to be moved relatively to one another in their longitudinal direction while still retaining their original distance apart and remaining parallel with one another. The linkage connecting the two rulers preferably consists of two sets of links arranged lazy tongs fashion, the two sets being coupled together so that movements of both linkages are the same, in order to retain the rulers in parallel relationship, the ends of the lazy tongs being pivoted to slides capable of movement along guides attached to the upper faces of the rulers so that the latter may be moved in a longitudinal direction while still remaining parallel.

In a preferred construction according to the invention the parallel rule consists of two component rulers to the upper face of each of which is attached a metal strip forming a guide, these strips being spaced from the top faces of the rulers. On each guide moves two slides and one slide of one ruler is connected to a slide on the other ruler by a lazy tongs linkage arrangement, while the other slide on the firstmentioned ruler is connected to the corresponding slide of the other ruler by a similar lazy tongs linkage. The innermost joints of both lazy tongs linkages are connected together by a pair of links which cross one another at their centres and are themselves pivoted together at their crossing point. This form of connection between the two rulers ensures that they may be separated by a movement entirely at right angles to their length, while still retaining their parallel relationship, since the lazy tongs linkages and the sliding connection between their pivots and the rulers enable such a movement to take place while the links interconnecting the two linkages ensures that the latter open to the same extent. By reason of the fact that the linkages are connected to the rulers by slides, the rulers may also be moved relatively to one another in the direction of their lengths while retaining their parallel positions and their original distance apart, by sliding the guides on the upper faces of the rulers within the slides to which the linkages are pivoted. The two rulers may thus be moved relatively to one another into any position within the dimensions of their construction while still retaining their parallel arrangement, and, if necessary, a point on the edge of one of the rulers may be made to trace a circular or elliptical path while keeping the other ruler fixed.

The parallel rule may be maintained in its closed position when not in use by means of a pair of clips fitting over the ends of the rulers and holding them together, while in order to facilitate movement of the rulers when the parallel rule is in use each ruler is provided on its upper face with a projecting finger grip by which the rule may be moved about.

Dated this 30th day of October, 1933.

ARTHUR E. EDWARDS,
Chartered Patent Agent,
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Agent for the Applicant.

COMPLETE SPECIFICATION

Improvements in Parallel Rules

I, WILLIAM BLAINE LUARD, Lieut. R.N. retired, a Subject of the King of Great Britain, of 14, Woodlane, Falmouth, in the County of Cornwall, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

With the well known construction of parallel rule, used for drawing or navigational purposes, in which the two straight edges or component rulers are connected together by a pair of parallel links pivoted at their ends on the upper faces of the rulers, the latter can only be moved about in a limited manner, owing to the fact that the pivots of the links must always move in circular arcs, so that it is only possible to vary the distance between the straight edges or rulers by moving one or both of them in the direction of their lengths at the same time, and similarly, the rulers can only be moved relative to one another longitudinally by varying at the same time the transverse distance between them.

The object of the present invention is to extend the range of movement of the two component rulers relatively to one another and provide a construction in which, for example, one ruler can be moved relatively to another longitudinally without alteration of the distance between the two rulers or, conversely, the transverse distance between the rulers may be varied without necessarily involving longitudinal movement.

According to the present invention therefore, the two rulers or straight edges forming the parallel rule are connected together by means of a linkage arrangement connected to slides capable of movement longitudinally of the rulers so that variation of the distance between the rulers and longitudinal movement thereof are independent, which enables the two rulers to be separated by a movement at right angles to their length, and also to be moved relatively to one another in their longitudinal direction while still retaining their original distance apart and remaining parallel with one another. The linkage connecting the two rulers preferably consists of two sets of links arranged lazy tongs fashion, the two sets being coupled together so that movements of both linkages are the same, in order to retain the rulers in parallel relationship, the ends of the lazy tongs being pivoted to slides capable of movement along guides attached to the upper faces of the rulers so that the latter may be moved in a longitudinal direction while still remaining parallel.

The slides may take the form of pieces sliding within guide slots cut in a longitudinal strip attached to the face of each ruler or may be pieces fitting over the edges of guide strips secured to but spaced from the upper face of each ruler.

Examples of constructions according to the invention are illustrated in the accompanying drawings in which Fig. 1 is a view of the parallel rule in its closed position.

Fig. 2 is a view of the rule in its open position when in use, with the component rulers moved longitudinally with respect to one another.

Fig. 3 is a part sectional end view of Fig. 4, the section being taken on the line III—III of Fig. 2.

Fig. 4 is a fragmentary view of a modified form of guide and slide arrangement, and Fig. 5 is a sectional view of Fig. 4 on the lines V—V of Fig. 4.

Referring first to Figs. 1 to 3, the parallel rule consists of two component rulers 1 having their outer edges bevelled as at 2. To the top face of each ruler 1 is attached, by screws or other fastenings 3, a metal strip 4 extending practically the whole length of the ruler, this strip being spaced from the face of the ruler by means of spaces 5 slipped over the screws 3. Each strip 4 is provided with a longitudinal central slot 6 in which move slides 7 provided with ears 8 which project under the strip 4 at the edges of the slot 6. From the upper face of each

slide 7 projects a pin or rivet 9 on which are pivoted the ends of the links forming part of the linkage connecting the two rulers 1. This linkage consists of pairs of short links 10 pivoted at one end on the pins 9, and spaced by a washer 11 from the slides 7, and opposite pairs of links 10 are connected by longer crossed links 12 pivoted together at 13 and to the links 10 at 14 and 14^1 to form two sets of lazy tongs. The innermost joints 14^1 of both lazy tongs linkages are connected together by a pair of links 15 which cross one another at their centres and are themselves pivoted together at their crossing point by a pin 16. This form of connection between the two rulers 1 ensures that they may be separated by a movement entirely at right angles to their length, while still retaining their parallel relationship, since the lazy tongs linkages and the sliding connection between their pivots and the rulers enable such a movement to take place, while the links 15 interconnecting the two lazy tongs linkages ensures that the latter open to the same extent. By reason of the fact that the linkages are connected to the rulers by slides 7 movable in the guide slots 6, the rulers 1 may also be moved relatively to one another in the direction of their lengths while retaining their parallel positions and their original distance apart. The two rulers may thus be moved relatively to one another into any position within the dimensions of their construction while still retaining their parallel arrangement, and, if necessary, a point on the edge of one of the rulers may be made to trace a circular or elliptical path while keeping the other ruler fixed.

The bevelled faces of the rulers 1 may be marked for use as a protractor or with any other appropriate scale and each ruler 1 is provided with a projecting stud or knob 17 forming a finger grip to enable the rulers to be more easily moved about.

In the modification shown in Figs. 4 and 5, the general construction is exactly the same as that shown in Figs. 1 to 3, but the strip 4 which is attached to the face of each ruler 1 by means of screws or other fastening means 3 and 3^1 and is spaced from the ruler by the spacers 5, is not provided with a guide slot but its longitudinal edges form the guide while the slide 7 is formed by a flat metal piece which has its edges turned under the edges of the strip 4 as at 18, and is thus capable of longitudinal movement along the guide strip 4. To permit free movement of the guide 7 along the strip 4 the heads of the screws 3 are countersunk flush with the strip 4, but the heads of screws 3^1 at each end project to form stops which prevent the slide from moving completely off the guide strip.

As in the previously described construction, the slide 7 is provided with a projecting pin 9 on which are pivoted the links 10 forming part of the linkage connecting the rules 1, this linkage being exactly the same as that shown in Figs. 1 and 2.

The parallel rule may be maintained in its closed position when not in use by means of a pair of clips fitting over the ends of the rulers and holding them together.

Any other suitable form of linkage may be used in place of the particular form of linkage shown.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A parallel rule comprising two component rulers connected together by a linkage which permits the two rulers to be moved apart while retaining their parallel relationship, the linkage being connected with the rulers through slides and guides which permit the rulers to be moved longitudinally in relation to one another while remaining the same distance apart and parallel.

2. A parallel rule comprising two component rulers joined by a linkage consisting of two sets of lazy tongs linkages which are connected together by a pair of links which cross one another at their centres and are themselves pivoted together at their crossing point, to ensure that both lazy tongs linkages are opened to the same extent as the rulers are moved apart and the parallel relationship of these rulers is retained, the ends of the lazy tongs linkages being pivoted on slides which are guided longitudinally of the rulers and permit the rulers to be moved longitudinally in relation to one another while remaining the same distance apart and parallel.

3. A parallel rule according to Claim 2, in which the slides at each end of the linkage move in a longitudinal slot cut in a guide strip secured to, but spaced from, the upper face of each ruler.

4. A parallel rule according to Claim 2, in which the slides move over the exteriors of guide strips and are guided by the longitudinal edges thereof, these strips being secured to, but spaced from, the upper faces of the rulers.

5. A parallel rule constructed substantially in the manner described with reference to Figs. 1 to 3, or Figs. 4 and 5 of the accompanying drawings.

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Dated this 30th day of November, 1934.

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FIG. 1

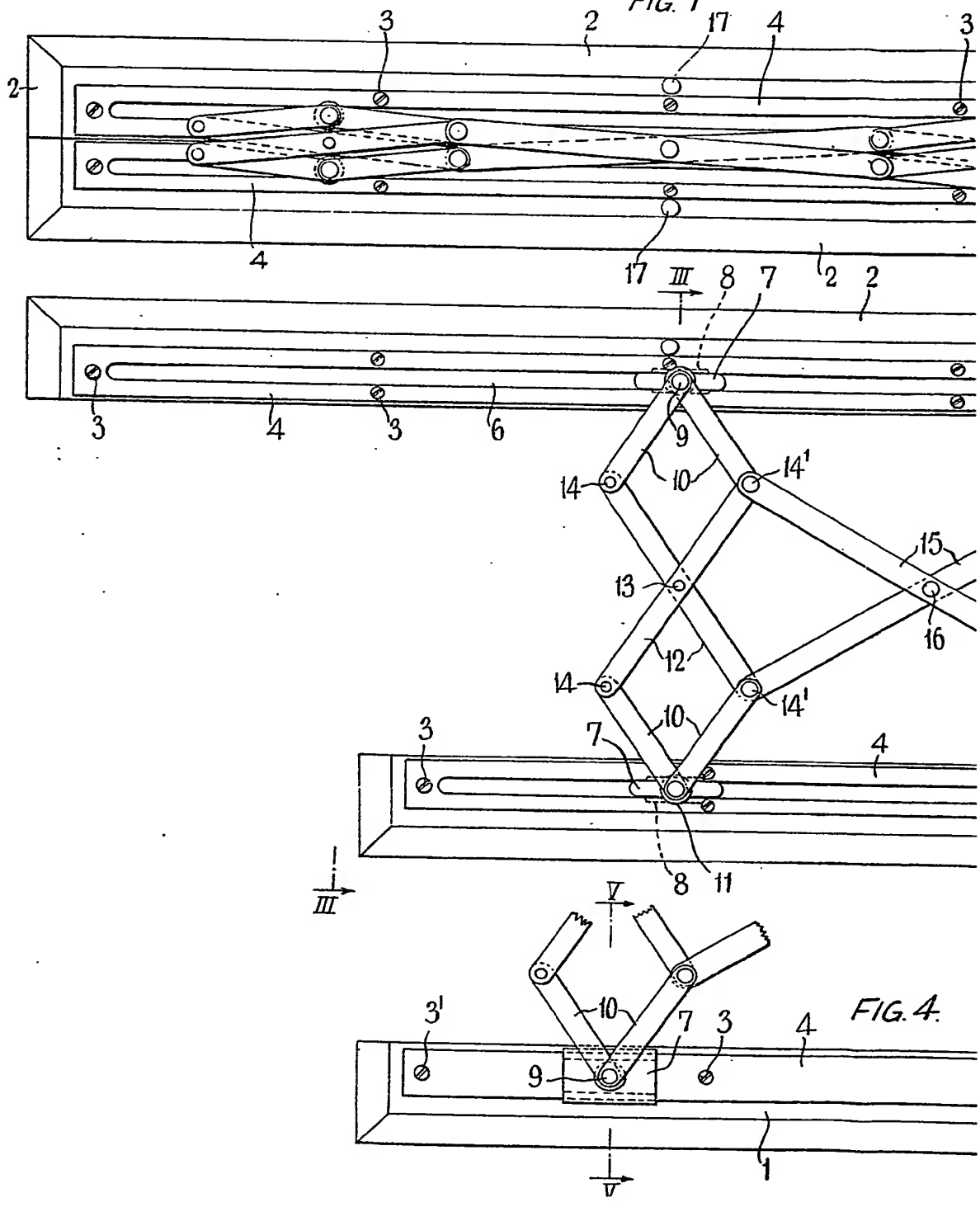

FIG. 4.

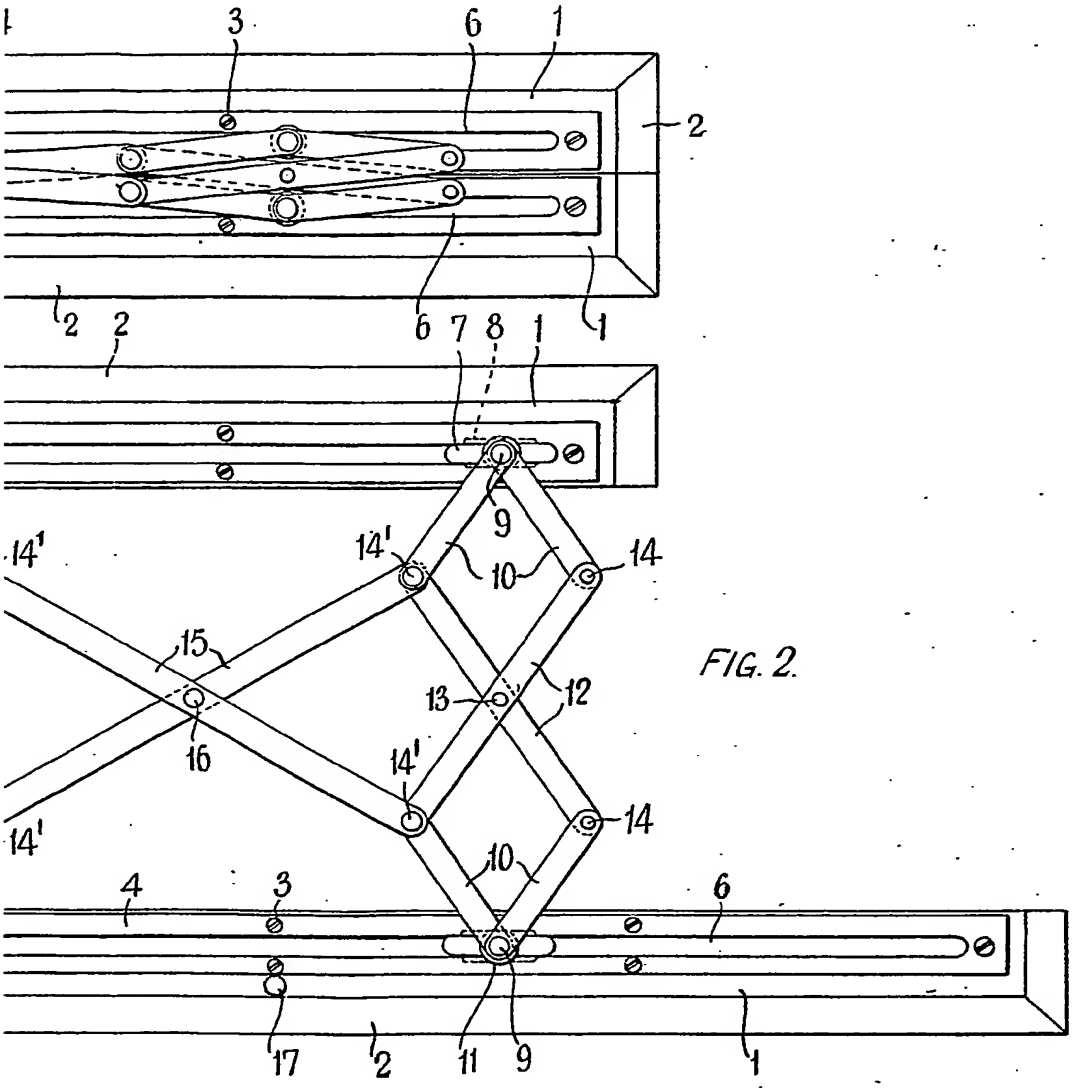

FIG. 2.

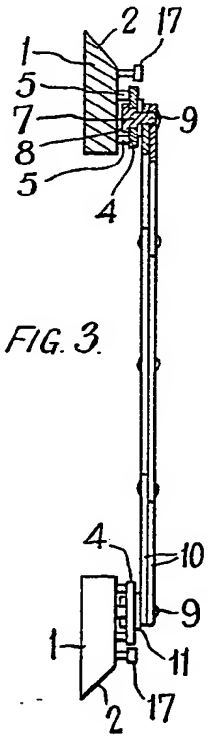

FIG. 3.

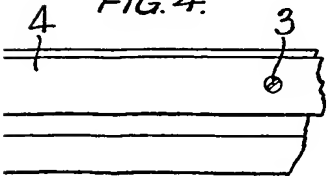

FIG. 4.

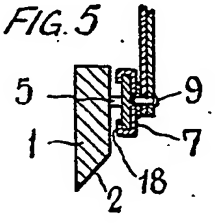

FIG. 5

Malby & Sons, Photo-Lith.

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